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DISCUSSION

ELMER BELT, M.D. (1893 Wilshire Boulevard, Los Angeles).—If one looks upon the urinary tract purely as a problem in plumbing, Doctor Happ has shown the necessity of revealing possible defects in the mechanism of transmission of the urine through it, defects which cannot be helped by drugs. The normally narrow areas at the ureteropelvic juncture and at the ureterovesical juncture may be further constricted by anomalies, scar or edema. Even in tiny babies the means is at hand of discovering these defects. Instruments are now available with which the urinary tract of the smallest baby may be visualized. Where the secretory power is still strong, diodrast may be injected subcutaneously and will reveal the infant urinary tract just as clearly as it does in the adult. When mechanical obstructions are found, the ureteral catheter can be used as an efficient means of relief and correction of the defect.

Again, due to his power of close observation, Doctor Happ has brought us a group of cases of a kind very rarely seen. There is nothing about the infant mechanism which would protect it from pyelitis. The factors which bring about this condition later in life must operate here with equal frequency. Indeed obstructive anomalies in the urinary tract should be apparent early in life, if we but have eyes to see their signs.

Doctor Happ has clearly outlined the method of combating urinary infection in these tiny patients. The mechanics of edema due to inflammation, narrowing further the normally narrow places in the tract, plus further obstruction from clogging due to particulate matter by epithelium, pus and bacterial bodies settling into these funnel-like narrowings, are dealt with concisely. There is no fundamental difference in type between the treatment afforded the babe and the adult. Fluids are forced to thin down the urinary stream, making less possible clogging from débris. Alkalies help relieve edema. Various urinary antiseptics are used. Mandelic acid and ammonium chlorid, when they are tolerated and when the kidney function is good enough to secrete them, are singularly effective in the colon group of organisms, and possibly the only antiseptic substance capable of destroying the bacillus fecalis. Sulfanilamide, the exceptionally ubiquitous urinary antiseptic, is effective wherever the plasma flows. It seems to strike both sides of the secreting mechanism, acting through the urine and through the plasma. It is effective even where the secretory power is poor, and ineffective only in combating streptococcus fecalis and streptococcus viridans. However, it is but weakly effective against the staphylococcus albus.

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PHILLIP E. ROTHMAN, M.D. (3875 Wilshire Boulevard, Los Angeles).—Pyuria in infancy has always created clinical interest because of our lack of knowledge relative to the mode of infection and the character of the lesion. This is due to the paucity of pathological observations. Accordingly, greater advances have been made in diagnosis and treatment. The younger the patient, the more likelihood that an abnormality of the urinary tract exists, and this is particularly true in the newly born. Gastro-intestinal symptoms, with vomiting and signs of pylorospasm, are common manifestations. Marked pallor without anemia is often observed. Sudden dehydration, without apparent explanation, is an alarming complication. The successful treatment by a skilled urologist is an impressive technical achievement that would have appeared almost incredible to the first generation of pediatricians.

Doctor Happ has emphasized what undoubtedly remains the most important phase of the entire subject, namely, the danger of permanent renal damage in cases that remain imperfectly treated. Medication may so completely mask the picture that the patient appears in excellent health, afebrile and asymptomatic, during the period of kidney destruction. The renal parenchyma may be destroyed either from compression in the presence of an organic obstruction, or as the result of infection. It is this latter group that may produce, after a lapse of years, the picture of chronic nephritis. The insidiousness of its development should be a constant warning to repeat urine examinations of all patients who have had a previous attack of pyuria, and, if infection persists, to demand a urologic study.

THE LURE OF MEDICAL HISTORY†

THE MICROPHONE, STETHOSCOPE, TELEPHONE, AND ARTIFICIAL AIDS TO HEARING

THEIR HISTORICAL RELATIONSHIP

By G. R. OWEN, M.D.
Los Angeles

A CERTAIN local otologist, who has done much experimental work with the audiometer, ascribed the first use of the word "microphone" to Bell and his contemporaries; and in its practical consideration he was correct. He was interested to know of its use two and one-quarter centuries ago, and asked that we write him in detail, which we did much as follows:

I have devised an instrument suitable for magnifying weak sounds which is called a microphone; the microphone in its present form consists simply of a lozenge-shaped piece of gas-carbon one inch long. . . .

Thus, David Edward Hughes, the English-American inventor, in 1878, to whom is credited the first use of the word, defines it. (The use of the carbon element is credited to Bell with a two-year priority.)

The telephone seems to have been born twin to the carbon microphone, so a brief interpolation as to its history may not be amiss. Dr. W. A. Dewey, a globe trotter with a penchant for the acquisition of scientific curiosia, writes me as follows:

There is a fine tablet displayed on the post-office in Florence which reads, "Antonio Meucci, inventore del telephone, morì 1889 in paese straniero povero e defraudato de suoi diretti." Professor Passani assured the writer personally that this statement is correct. The Minister of Finance in France in 1890 conceded that M. Charles Étienne Bourseul really invented the telephone in 1854, for which he received the Legion d'Honneur. . . . The writer recalls being shown in Vienna some forty years ago, in an old German encyclopedia, a cut of an apparatus describing a "fern-sprecher" that dated a century or more ago. The old Herr Professor who produced this evidence did so to dispute my boastful claims that it was an American who invented the telephone.

The mammoth Oxford dictionary traces the word back to the "Philosophical Transactions," 1727, thus:

Microphones or miraculous sticks . . . that is, magnifying ear instruments.

† A Twenty-Five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellany department, and its page number will be found on the front cover.

We have been unable to find the word in any dictionary prior to 1706, where Phillips defines it:

Microcousticks or microphones; instruments contrived to magnify small sounds, as microscopes do small objects.

One concludes that this new word was without great interest or significance, for even Johnson ignores it in his sixth edition, and it does not appear again until 1827, when Sir Charles Wheatstone, the English physicist, claimed paternity.

Three instruments for the magnification of sound were submitted to the Royal Society between 1665-1681. One wonders if there is some connection between "microcousticks" and "miraculous sticks"; a sort of corruption of a Hellenism into the vernacular, or were the devices submitted of a stick form. The latter, probably, for we recall that René Laennec, the inventor of the stethoscope (1819), when confronted with a very obese female patient, and finding the ear-to-skin method neither esthetic nor adequate, said: "I happened to recall a simple and well-known fact in acoustics and fancied it might be turned to some use on this occasion. The fact I allude to is the distinctness with which we hear the scratch of a pin on one end of a piece of wood on applying our ear to the other."

It is a far cry from the ubiquitous broadcasting "mike" which alternately titillates and torments us, to the primitive stethoscope; yet the definition, "instruments contrived to magnify sound," of 225 years ago, is as aptly applicable to the latter as to the former. They were, indeed, classified and indexed under "Artificial Aids to Hearing," by the Royal Society of the seventeenth century.

That irritable, disputatious, versatile and scientifically admirable Robert Hooke (1635-1702), Curator of the Royal Society, has given us a very definite picture of the possibilities of sound transmission and magnification by means of his otocousticons, two of the three "artificial aids" previously mentioned; a son of that century, acclaimed as the century of the birth of experimental science wherein we may contrast such an absurdity as Digby's "Sympathetic Powder" with William Harvey's revolutionary "De Motu Cordis." We find Harvey following Willis in the famous case of Lady Conway only to be supplanted by Greatrakes, the notorious Irish Stroker, a magnificent quack. It was the age of Kepler, Newton, and Galileo, yet we know that in the realm of physics it was forbidden to deviate from the principles of Aristotle, and this prevailed one hundred years after the experiments of Galileo, who had been forced to renounce many of his contradictions as heresies. The Parisian universities were adamant, and "Stubbeites" in England bellicose. Into this era of credulity and bigotry was born the great Royal Society at old Gresham, with its Harveian doctrine of "observation, hypothesis, deduction and experiment."

Exhaustive experimental studies were made of sound and acoustics in that century, and it would be strange indeed if much attention had not been given to the transmission of sound over long distances, a crying need centuries before Alexander

had summoned his troops by means of enormous horns of bronze. And so there was, and the consideration of the history of telephonics injects itself into our potpourri title. Hark to Hooke!

'Tis not impossible to hear a whisper a furlongs distance, it having been already done; and perhaps the nature of the thing would not make it more impossible, though the furlong should be ten times multiply'd. It has not been yet thoroughly examin'd, how far the Otocousticons may be improv'd, nor what other ways there may be of quickening our hearing, or conveying sound through other bodies than the Air: for that is not the only medium, I can assure the Reader, that I have by help of a distended wire, propagated the sound to a very considerable distance in an instant, or with as seemingly as quick a motion as that of light, at least, incomparably swifter than that, which was at the same time propagated through the Air; and this not only in a straight line, or direct, but in one bended in many angles.

The earliest practical application of sound magnification appliances to the aid of the deaf is found in the "Phonurgia Nova" of Athanasius Kirscher, the Jesuit, published in 1673, which described many modifications of an elliptical double-ended tube, one of which Banzer had used in 1640, and to which he had added a diaphragm of pig's bladder on the receptor end; very possibly the inspiration of the "artificial tympanum" of Hooke's otocousticon. These primitive conceptions, as well as the equally primitive trumpet, have persisted in many of our present forms. Magnetism was the only electrical modality known in his day, so as Halsey Fredericks of the Bell Laboratories states, electrical amplification could not have been a factor. Hence, Hooke's devices could have made no radical departure from the then accepted forms. The "miraculous stick" used by Laennec had long been adapted to both air and bone conduction, though not as a stethoscope. An early and interesting form of the bone-conduction type was the double-end tube—an end each for the teeth of the speaker and the listener, much as the famous Paladino rod transmits from the larynx of the speaker to the cranial bones of the subject. This principle exists today in the Japanese otocoustic fan, which utilizes a dental contact.

The length of a chord required to the pitch; the laws of vibrating chords and the velocity of sound were known to the Royal Society, and in all of this Hooke was interested. Pepys, himself an excellent musician, relates that a discourse of Hooke's on musical notes was excellent, but, he records, "to tell how many strokes a fly makes with her wings is a little too much refined." Pepys was incredulous, but he possessed the discernment necessary to rate the insignificant-appearing Hooke over that wealthy, aristocratic, and excellent scientist, Robert Boyle.

The following quotation from Hooke is disturbing to our twentieth century smugness. A dreamer of dreams and a doer of deeds, Hooke with his microphones invaded a field in which he was but a dilettante. By no means can we give him priority in the invention and use of the stethoscope, for his concluding sentence in the following quotation is a disclaimer; but by 150 years we can grant him priority over Laennec in everything but the urge of pursuit born of Laennec's medical training and environment:

There may also be a possibility of discovering the Internal Motions and Actions of Bodies by the sound they make, who know but that as in a Watch we may hear the beating of the Balance, who knows I say, but that it may be possible . . . that one may discover the Works performed in the several Offices and Shops of a Man's Body, and thereby discover what Instrument or Engine is out of order, what Works are going on at several times and lie still at others, and the like. . . . I could proceed further, but methinks I can hardly forbear to blush, when I consider how the most part of men will look upon this. . . . And somewhat more of Incouragement I have also from Experience that I have been able to hear very plainly the beating of a Man's Heart, . . . the stopping of the Lungs is easily discovered by the Wheezing . . . for to me these Motions and the other seem only to differ secundum magis et minus, and so to their becoming sensible, they require that their motion be increased, or that the Organ (the examiner's ear) be made more nice and powerful to sensate and distinguish them, many cases *there may be Helps found, some of which I may, as opportunity is offered, make Trials of, which, if successful and useful I shall not conceal.*

1800 West Sixth Street.

JOHN TOWNSEND—THE PERIPATETIC PIONEER*

By FRANCES TOMLINSON GARDNER
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PART I

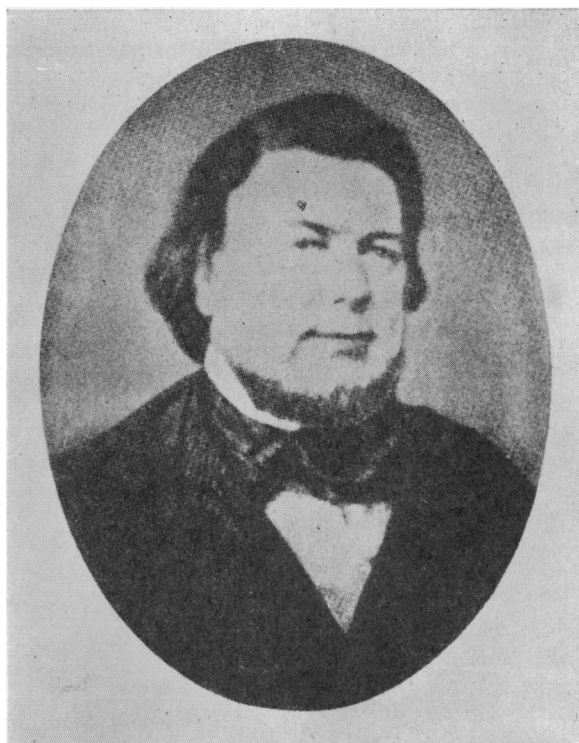
ALTHOUGH they followed a calling whose usual habitat is a single restricted locality, the medical men of the '40's and '50's were no more immune to the call of adventure than men of any other profession. As the long lines of emigrant wagons spread across the great plains, and the white sails and puffing stacks of ships left eastern harbors bound for California, most companies contained one or more disciples of Aesculapius. These physicians were adventurers fundamentally and no call of duty, love or money was as strong as the siren song of the unknown. In the early days of California, even before the rush for gold became the goal, such a number of doctors appeared within her boundaries that she was overpopulated with them, and many turned to other things to make a living. They were jacks of all trades, and some of the occupations in which they expended their excess energies were hard to justify by the oath of Hippocrates. They became merchants, miners, soldiers, editors, and farmers, and at least one became a swindler. They sought and found their levels as inevitably as though they had never left their native states.

DR. JOHN TOWNSEND

A pioneer of pioneers, a perpetual seeker after the foot of the rainbow, was Dr. John Townsend, a member of the first party ever to bring wagons into California.

John Townsend was born in Fayette County, Pennsylvania. The date of his birth seems uncertain, but can be placed reasonably within the first ten years of the nineteenth century. His father was an Englishman, a pioneer of Fayette County, who brought up little John on bed-time stories of exciting pioneering in uninhabited Pennsylvania.

* From the University of California Medical School Library and the California State Medical Library.



JOHN TOWNSEND

Early in his life the boy showed passionate interest in the feats and struggles of inhabitants of an outpost.

Townsend had the average American education of his day and took his degree from Lexington Medical College. No more had the ink on his diploma dried than he began to show the spirit of curiosity and the inability to stay put which characterized him all his life. Gradually he wandered farther and farther West, as though drawn by an invisible magnet. Although he had never heard of California in more than a casual way, it was as if he could not resist the sound of the waves on the shore of the Pacific Coast. After a year or two of practice in Pennsylvania, now too bucolic by far, he turned up in Ohio where he was married, in Stark County in 1832, to Elizabeth Louise Schallenberger. Finally, in 1843, he was obstetrician, surgeon and general practitioner in Buchanan County, Missouri, having made a brief stop in Indiana en route. As he rode about on his rounds he heard the county people speaking more and more about this wonderful new land beyond the Rocky Mountains. It was Mexican, to be sure, but reputed to be bounteously supplied with all the good things of the earth. It was fertile, it was delightfully warm in winter and cool in summer, and it was practically unpopulated except for some notoriously lethargic Spanish folk and a lot of very lazy Indians. The consensus of Missourian opinion was that a man would have an unexampled opportunity there if he were willing to apply himself—and if he were willing to make the laborious trip necessary to reach the promised land.

Townsend was anything but hard to persuade. He had put down no roots to speak of since gradu-